

TRANSVAAL CRUSTACEA.

PART II.

Notice of a Freshwater Amphipod from South Africa.

By PAUL A. METHUEN.

Family GAMMARIDEA Leach.

Genus *Eucrangonyx* Stebbing.

Eucrangonyx robertsi Methuen.

SUFFICIENT is now known of the fauna of South Africa to show us that nearly all the groups of animals found in this country include some creatures which are peculiar to it, and are also often lacking in forms dominant in other parts of the world. In the class Crustacea we find these facts admirably illustrated. We learn, however, that the three orders embracing these creatures are wholly unrepresented, and we are aware of the fact that freshwater crabs (*Thelphusidae*) and freshwater prawns (*Atyidae* and *Palaemon*) are the only Crustacea Malacostraca recorded from our rivers,* whereas the Crustacea Entomostraca are represented not only by forms having a wide distribution and which may range into the tropics, but by genera which are peculiar to South Africa.

Huxley, in "The Crayfish" (p. 336), makes the following remarks: "In warm climates . . . not only the large prawns, . . . but *Atyae* and fluviatile crabs (*Thelphusa*) compete for the possession of the freshwaters; and it is not improbable that, under such circumstances, they may be more than a match for crayfishes; so that the latter might either be driven out of territory they already occupied, as *Astacus leptodactylus* is driving out *A. nobilis* in the Russian rivers, or might be prevented from entering rivers already tenanted by their rivals.

"In connection with this speculation, it is worthy of remark that the area occupied by the fluviatile crabs is very nearly the same as that zone of the earth's surface from which crayfish are excluded, or in which they are scanty. That is to say, they are found in the hotter parts of the eastern side of the two Americas, the West Indies, Africa, Madagascar, southern Italy, Turkey and Greece, Hindustan, Burmah, China, Japan, and the Sandwich Islands. The large-clawed fluviatile prawns are found in the same regions of America, on both east and west coasts, in Africa, southern Asia, the Moluccas, and the Phillippine Islands; while the *Atyidae* not only cover the same area, but reach Japan, extend over Polynesia to the Sandwich Islands on the north and New Zealand on the south, and are found on both shores of the Mediterranean; a blind form (*Troglocaris schmidtii*), in the Adelsberg caves, representing the blind *Cambarus* of the caves of Kentucky." Madagascar, however, must be added to the list of countries in which species of *Palaemon* and *Atyidae*

* It is true that one finds amphipods in freshwater or brackish vleis on the Cape Flats and in the Cape Peninsula; but these Crustacea are without doubt animals which have become accustomed in very late times to a mode of life neither marine nor yet truly freshwater.

ERRATA.

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NOTICE OF A FRESHWATER AMPHIPOD FROM SOUTH AFRICA.

P. 96, line 5 : delete " however."

P. 96, line 6 : in place of " these creatures," read " the Crayfishes and the freshwater Isopods and Amphipods."

P. 97, line 41 : " taken " should read " taken* " and at bottom of page read as note :

* For a detailed description *vide* Proc. Zool. Soc., Dec., 1911.

Also p. 96 : after " *Eucrangonyx robertsi* Methuen " add " Proc. Zool. Soc., Dec., 1911, p. 948, Pls. XLIX-LI."

are found in the rivers; this country, therefore, seems to be an exception to the general rule, for we find an isolated species of crayfish thriving where Thelphusidae, Atyidae, and *Palaemon* occur.

To what extent can we correlate the distribution of the freshwater amphipods with that of the crayfishes?

Gammarus occurs in both hemispheres, but appears to be absent from the tropics. In the southern hemisphere we find, according to Smith ("Freshwater Crustacea of Tasmania", Trans. Linn. Soc., 1909), such typical Tasmanian Crustacea as *Anaspides*, *Phreatoicus*, *Neoniphargus*, *Gammarus*, and *Boeckella*, distributed in temperate climes together with New Zealand forms, very few of which range into tropical zones. Two genera, *Chiltonia* and *Boeckella*, characteristic of temperate regions, occur in temperate South Australia, Tasmania, New Zealand; and in South America *Hyallela*, closely allied to *Chiltonia*, and *Boeckella* itself, have been found. The peculiar genus *Broteas* Loven, speaking purely from a geographical point of view, seems to take the place of the last-mentioned genus in South Africa.

Taking these facts into consideration, the discovery of a blind freshwater amphipod inhabiting caves in the Transvaal is not without its particular interest as indicating conceivably the remnant of a river fauna in its last stages of extinction by the present successful combination of crabs and prawns. In Madagascar, where the crayfish *Astacoidea* still holds its own, we may be witnessing an earlier stage in the extermination of an older river fauna, which was similar to, or had much in common with, an ancient South African river fauna in which the ancestors of the subject of this paper may have had a place.

It would be as well, before speculating on the derivation of this little animal, to consider briefly its relationship to forms found in other parts of the world; for this purpose a short description at this point may not be out of place.

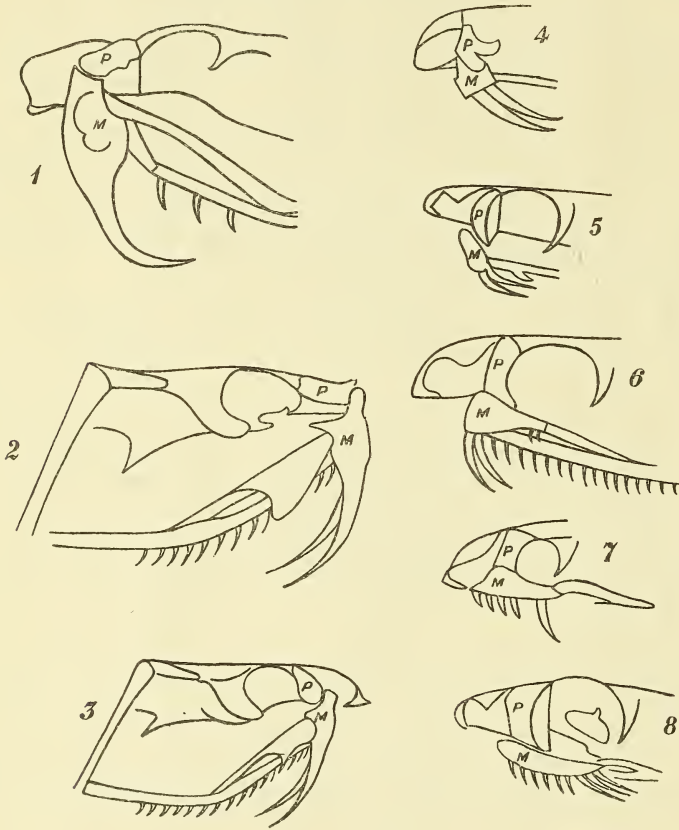
The Rev. Noel Roberts and Mr. J. Hewitt, of the Albany Museum, Grahamstown, are responsible for having first brought this animal to light and recognized its importance. They obtained examples some eighteen months ago from a cave containing a little fresh water at Irene, which is not far from Pretoria. Mr. Hewitt very kindly gave me the specimens to describe, and, hoping to get a larger series, I went with Mr. Austin Roberts to the Makapan Caves, near Potgietersrust. Here we found that two large caves supported a great number of these amphipods, besides some copepods and ostracods, and we were able to obtain some large and excellent specimens; it is from one of these, a large female, that the following somewhat abbreviated description has been taken.

Description of a Female from the Makapan Caves, Transvaal.—Length, 11 mm.; colour, dirty yellow or pink (according from which caves specimens were taken the colour was found to be dirty yellow or pink or semi-transparent white). Eyes absent. Body rather compressed, smooth, without carina; rostrum barely perceptible. The last three or five segments with spines on posterior margin.

The first four coxal plates of the pereopods deeper than the rest, the first smallest, the third and fourth deepest; the fourth plate broader than the others: the side-plates of the fifth, sixth, and seventh pereopods small, those of the fifth and sixth deeply emarginate behind apparently. These coxal plates bear small spines marginally.

Antennules long, longer than the antennae; flagellum much longer than the peduncle; first joint of the peduncle a little shorter than the

second and third joints together; second joint rather longer than the third; accessory flagellum two-jointed, armed with setae, hardly as long as first joint of flagellum. Each joint of antennule provided with setae, which on the flagellum after the eighth joint number seven, and display an unvarying arrangement.



Antennae: the peduncle longer than the flagellum; ultimate and penultimate joints of peduncle well provided with setae; the distal part of the flagellum joints carry about eight setae each, disposed in an unvarying sequence.

Mandibles of unequal size and of slightly different structure on each side; palp rather like that of *Paracrangonyx compactus* Chilton, except that the second joint is broader.

Maxillala much like that of *P. compactus*: the endite of the first joint bears two plumose setae and a number of hairs on the inner margin.

Maxilleped: not unlike that of *P. compactus*; however, slenderer, and the seventh joint is shorter.

Gnathopods well developed, subchelate; both pairs of about the same size and length; the fifth and sixth joints of gnathopod I somewhat broader than those of gnathopod II.

Pareiopods: numbers I and II subequal, shorter than the succeeding ones; number V the longest; second joint of numbers III, IV, and V broader

than of I and II. All with normal setae. Terminal joint not elongated in the first two pairs.

Pleopods: normal; bear coupling hooks on basal portion; the longest pleopod is the second.

Uropods: the first is the longest; the third uropod not quite as long as the first; the second uropod about two-thirds as long as the first. The peduncle of the first long, longer than either rami, much longer than the peduncle of the second; peduncle of the second much longer than that of the third.

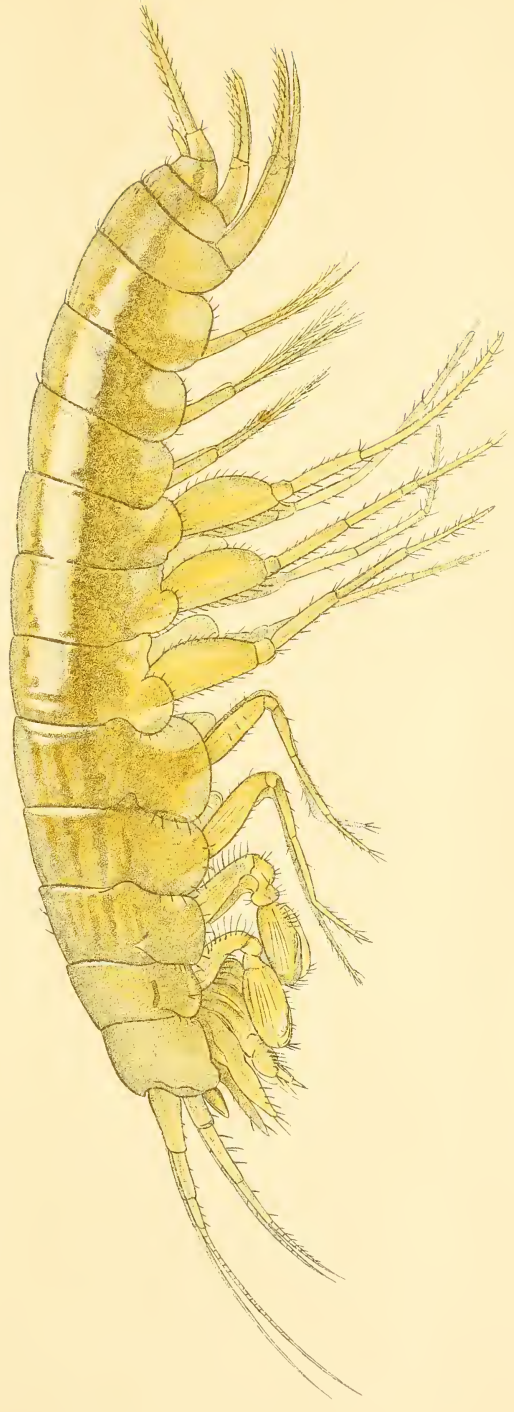
Outer ramus of the third uropod much longer than those of the first; inner ramus, with single spine, minute.

Telson: almost square, excavate: four spines on each side terminally, two subterminally.

It appears from the study of the external anatomy that this amphipod comes within the limits of the genus *Eucrangonyx*, and from Stebbing's account in "Das Tierreich" to resemble somewhat closely *E. vejdoskyi* Stebbing, which has been taken in wells near Prague. It has accordingly been placed in this genus, and near *E. vejdoskyi* for convenience' sake rather than by way of suggesting its origin, and a name in honour of Mr. Noel Roberts has been proposed for it.

It is in the nature of the uropods that *Eucrangonyx robertsi* seems to possess the chief character of distinction. Other characters suggest that it is related to *Paracrangonyx compactus*, from which, however, it differs in possessing normal pleopods, for in *P. compactus* these appendages are univamous; it is also more distantly related to the genus *Neoniphargus* Stebbing. This cave crustacean, therefore, possesses representatives to which it is closely allied in various parts of the world. The difficulty in determining exactly what is the form it is most nearly related to is due chiefly to the fact that convergence may possibly account for a good deal of similarity existing in two or more allied creatures living under similar conditions though widely separated.

Chilton, in his paper on the "Subterranean Crustacea of New Zealand" (Trans. Linn. Soc., 2nd ser., Zool., Vol. VI, Part 2, 1894), has pointed out the probability of the subterranean Crustacea of that island having been derived directly from surface freshwater forms, only indirectly or earlier in their history from allied marine animals. On p. 255 (*loc. cit.*) he says: "No doubt the subterranean Crustacea, as well as the freshwater forms, have originally sprung from forms inhabiting the sea, but from a fuller array of facts now before us there can be no doubt that they have not been derived directly from these, but from a freshwater fauna. *Niphargus* and *Crangonyx* (Chilton included *Paracrangonyx* in the genus *Crangonyx*) may, perhaps, show affinities to marine forms, and there certainly does not appear to be any closely allied form now inhabiting the surface freshwaters of Europe; but in North America various species of *Crangonyx* are found in surface streams, etc., and the fact that a closely allied form is found in the freshwaters of Tasmania seems to show that the genus has probably been at one time widely spread in the freshwaters of the globe." Later, he says: "While this conclusion seems to be well founded (in reference to the subterranean forms being derived from surface freshwater ones) it by no means follows that the subterranean fauna is necessarily derived from the freshwater fauna *at present* inhabiting the surface streams and lakes; indeed, there are several facts which seem to show that some species at any rate are derived from a more ancient surface fauna."



Wes. Newman, del.

EUCRANGONYX ROBERTSONI

type has been taken, and that the change which has come about has induced in *Eucrangonyx robertsi* a decided likeness to *E. vejdoskyi*.

We must admit, in conclusion, that we cannot dogmatize in the matter of the origin of this detached cave-dweller. There seems to be insufficient evidence for us to assert definitely that it owed its origin to surface freshwater gammarids which may formerly have occupied the rivers of South Africa together, perhaps, with isopods and crayfishes. On the other hand, it is no easy matter to understand how, as a cave form, it has spread from Europe. The former theory, however, harmonizes pretty well with other facts concerning the dual nature of the South African fauna, and seems, on the whole, a likely explanation.